

# A Study on the Attitudes of Nursing Students as Regards Cadaver Donation and Change of Cadaver Donation Intention after Attending Cadaver Anatomy Program

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## Abstract

**Background/Objectives:** This study was performed to investigate the nursing students' attitude as regards cadaver donation and change of intention in cadaver donation after participation in cadaver anatomy program, and then to present basic data to spread a healthy culture of cadaver donation.

**Methods/Statistical analysis:** A survey was conducted for 80 first-year nursing students in Korea. The questionnaire for the attitude as regards the cadaver donation was made up of 12 items on a 5 Likert scale. Attitude were collected before attending the cadaver program and intention were collected before and after. For the analysis of data, one-way ANOVA, and independent t-test were used.

**Findings:** This study showed that attitude as regards cadaver donation had a significant difference according to religion ( $p < .001$ ). The attitude score was 3.33 points. The rate of positive intention in cadaver donation before attending the cadaver program was 12.5%. The rate of change of intention after participation in cadaver program was 30%. Among them, 62.5% changed negatively than the original intention and 37.5% changed positively than the original intention.

**Improvements/Applications:** Efforts are needed to spread positive awareness through educational programs that nursing students can improve their knowledge and understanding about cadaver donation before attending the anatomy practice using cadaver.

**Keywords:** Cadaver anatomy program, Cadaver Donation, Attitude, Intention, Nursing Student

## 1. Introduction

Even though multimedia programs based by computer are being introduced to replace the necessity for cadaver donation, the best effective human anatomy education would be a cadaver practice proceeding in parallel with an anatomy theory class [1-3]. Cadaver practice allows the human body to be seen and touched with real eyes, so the structure and function of each organ can be understood clearly. Nationwide medical colleges and medical graduate schools are working through organizations related to cadaver donation to secure bodies, but it is decreasing slightly since 2005, even though there is a slight difference depending on the university [4]. According to the Korean Association of Anatomists, it is estimated that an annual average of 400 anatomical bodies for student education and more than 300 anatomical bodies for doctor training are donated to university hospitals, however, it shows that even the Ministry of Health and Welfare does not manage even basic statistics on how many bodies are dissected per year, thus a bill obligating the status of cadaver donation was proposed in 2018 [5]. In previous studies, as a reason for the reluctance to donate organs during brain death, it was considered important that the body was not damaged after death [6-8]. Furthermore, as a result of the analysis the overall importance and overall priority of the factors affecting the activation of cadaver donation consent, the first priority was the improvement of the culture of reluctance to damage the corpse [9]. For nursing students, anatomy practice using cadaver is very important and helpful [10], but as the majority of students do not notice the contents of cadaver donation before participating in the practice, it will be very significant to know and understand the contents of cadaver donation properly from an early stage and to inspire a positive attitude toward it as a nursing student.

In a study [11] on the organ donation intention of high school students, 70% of the students answered that they had an intention in their organs donation, and the higher their interest and receptive attitude toward organ donation, the more positive their intention to donate organs [6]. In a study on the practice and knowledge about the organ donation from brain-dead individuals for college students, the higher the degree of hope for organ donation, the higher the knowledge score [12]. The study on nursing students showed that the perception of organ donation had a negative correlation with death attitude, and a positive correlation with spiritual health [13] and students who participated in the anatomy camp had significantly higher attitudes as regards human tissue transplantation and donation than students who did not attend [14]. In a study on the cadaver donation of health and medical students, whilst the attitude of cadaver donation measured before the practice of cadaver showed a positive attitude more than average, after

participating in the practice, there were slightly more negative changes in intentions toward cadaver donation [15]. As such, there are many studies on attitudes toward organ donation, but the study of attitudes toward cadaver donation is very restricted. Therefore, this study is intended to provide basic data for spreading a healthy culture of cadaver donation by identifying changes in the attitudes of nursing students toward cadaver donation and their intention to donate cadaver after participating in anatomy practice.

## 2. Materials and Methods

### 2.1. Subject of the study

The subject for this study are freshman students in the Department of Nursing at K University in W city, Korea and the number of the subjects is a total of 80 students, who agreed to attend this study and understood the purpose of the study, out of the students who attended the cadaver practice program during the winter vacation period after taking the anatomy course in the second semester.

### 2.2. Tool of the study

There were a total 21 questions in the questionnaire that consist of 6 questions for general characteristics, 12 questions for attitude as regards cadaver donation, and 3 questions for change in cadaver donation intention after the cadaver program. The attitudes toward cadaver donation were 12 questions [15] that had been modified and supplemented with the attitude tools [16-17] related to organ donation, and on a 5-point scale was applied to each question (not at all: 1 point, very positive: 5 points) and 2 questions out of them were treated as a reverse calculation. It means the higher the attitude score for cadaver donation, the more positive it is for cadaver donation. In the precedent study, the reliability of the tool was Cronbach's  $\alpha = .828$ , and it was Cronbach's  $\alpha = .804$  in this study.

### 2.3. Data collection

The schedule of the cadaver program was commissioned to the anatomy class at S University Medical College in Shanghai, China, and operated for a total of 4 days (January 10 to 13, 2020). Before participating in the practice on January 9, the questionnaire was conducted on general characteristics, attitudes toward cadaver donation, and cadaver donation intention, and the change in the intention for cadaver donation was identified on January 14 after the end of the 4-day practice session. Before attending the practice, the purpose and method of the study were given an explanation and consent was acquired in writing from the respondents who agreed to attend the study. It was explained that as the survey was conducted before and after attending the practice, the intention to participate would be able to be changed at any time, and there would be no disadvantage at all.

### 2.4. Data analysis

The data of collection were analyzed with SPSS version 25.0, and the analysis methods that were used were descriptive statistics, one-way ANOVA, independent t-test.

## 3. Results

### 3.1. General characteristics of study respondents

The study respondents were 92.5% (74 students) female and 7.5% (6 students) male, and the number of non-religious respondents was 66.3% (53 students) which is more than the one of religious respondents 33.8%. Before participating in the cadaver program, the respondents who were interested in the human body structure and had experience in visiting the human exploratory exhibition were 17.5% (14 students). 42.5% (34 students) answered that they were in good health, and 22.5% (18 students) had patients in their immediate family. There were no respondents who answered that their immediate family members had donated the cadaver before [Table 1].

**Table 1: General characteristics of the respondents (N=80)**

Characteristics	Division	n	%
Gender	Male	6	7.5
	Female	74	92.5
Religion	Yes	27	33.8
	No	53	66.3
Experience similar to anatomy program	Yes	14	17.5
	No	66	82.5

Health status	Good	34	42.5
	Moderate	38	47.5
	Poor	8	10.0
Existence of patient among immediate family	Yes	18	22.5
	No	62	77.5
Donation cadaver among immediate family	Yes		
	No	80	100

### 3.2. Attitudes toward donating cadaver according to general characteristics

Attitudes toward cadaver donation were significantly different according to religion among general characteristics ( $p < .001$ ). In gender, men had higher attitude scores than women, however, there was no significant difference ( $p = .517$ ). In the presence or absence of similar experience in the past, the respondents who had no experience at all were somewhat higher, but there was no significant difference ( $p = .842$ ). In health status, the case of poor health which is 3.50 points was higher than the one of good or normal health, however, there was no significant difference ( $p = .457$ ). The case of having a patient in the immediate family (3.38 points) is higher than the case of no patients (3.32 points), but there was no significant difference ( $p = .650$ ) [Table 2].

**Table 2: Attitude toward cadaver donation according to general characteristics (N=80)**

Variable	Division	Mean	SD	t/F(p)
Gender	Male	3.46	0.66	.423(.517)
	Female	3.32	0.48	
Religion	Yes	3.57	0.48	10.897(<.001)
	No	3.21	0.45	
Experience similar to anatomy program	Yes	3.30	0.50	.040(.842)
	No	3.34	0.49	
Health status	Good	3.27	0.48	.792(.457)
	Moderate	3.36	0.52	
	Poor	3.50	0.30	
Existence of patient among immediate family	Yes	3.38	0.45	.207(.650)
	No	3.32	0.50	

### 3.3. Analysis of attitude toward cadaver donation by question

The overall score for the attitude toward cadaver donation was 3.33 points on a 5-point scale [Table 3].

For each question, cadaver donation is helpful to others(4.41 points)', 'cadaver donation is important(4.24 points)', 'The information on cadaver donation should be introduced more specifically into school education(4.15 points)', 'cadaver donation is a

great decision making at no cost(4.14 points).’, ‘it is desirable to systematically institutionalize cadaver donation at the national level.(4.01 points).’ The score of these previous questions was higher than the average. Also, ‘If I donate my body to a specialized institution when I die, as this decision is a generous act, my family will understand me.’, this question was 3.25 points, and ‘if one of the family members shows the cadaver donation intention, I will respect the family’s intention and help them actively connect with the corresponding institution’, this question was 3.06 points. The question which had the lowest score (2.36 points) was ‘cadaver donation is a good and positive option for families who lost a loved family member, even in the case that the deceased has not expressed an opinion to donate the body for his or her lifetime.’

**Table 3: Mean value of each question in attitude toward cadaver donation (N=80)**

Items	Mean	SD
Cadaver donation is helpful good to others.	4.41	0.57
Cadaver donation is important.	4.24	0.66
Cadaver donation is a great decision at no cost.	4.14	0.81
The information on cadaver donation should be included and should be introduced specifically into school education.	4.15	0.78
It is desirable to systematically institutionalize cadaver donation at the national level.	4.01	0.95
I have an intention in donating my cadaver after death if possible.	2.49	0.98
If one of the family members shows the cadaver donation intention, I will respect the family’s intention and help them actively connect with the corresponding institution.	3.06	1.37
When I die, my family will feel uncomfortable and upset if my family is asked to donate my body.*	2.74	1.04
Cadaver donation is a good and positive option for families who lost a loved family member, even in the case that the deceased has not expressed an opinion to donate the body for his or her lifetime.	2.36	1.06
Even after death, I want my body to remain intact (I don't want to be dissected or scarred).*	2.65	1.10
If I donate my body to a specialized institution when I die, as this decision is a generous act, my family will understand me	3.25	0.95
Cadaver donation will help the deceased’s family overcome the grief of losing a loved one.	2.50	1.03
Total	3.33	0.49

\*reverse calculation

### ***3.4. Intention as regards cadaver donation before attending cadaver program***

The intention toward cadaver donation surveyed before the cadaver program was positive (10 students), neutral 53.8% (43 students) and negative 33.8% (27 students) [Table 4].

**Table 4: Intention toward donating cadaver before attending cadaver anatomy programs (N=80)**

Intention	N	%
Negative	27	33.8
Neutral	43	53.8
Positive	10	12.5

### 3.5. Changes in intention as regards cadaver donation after attending cadaver program

After the cadaver program, 30% (24 students) showed a change of intention, of which the case of changing negatively was 62.5% and the case of changing positively was 37.5% [Table 5].

**Table 5: Changes of cadaver donation intention after attending cadaver anatomy programs(N=80)**

	Division	N	%
Changes of intention	Yes	24	30
	No	56	70
Direction of change	From neutral to negative	9	37.5
	From positive to neutral	5	20.8
	From positive to negative	1	4.2
	From neutral to positive	4	16.7
	From negative to neutral	3	12.5
	From negative to positive	2	8.3

### 3.6. Reasons for changes of cadaver donation intention after attending cadaver anatomy programs

After participating in the cadaver program, 24 people who changed their intention toward cadaver donation subjectively described the reason for the change of intention. The main reasons why the intention toward cadaver donation had been changed more negatively than before were described as 'because I felt sorry and uncomfortable for the damage to the body', 'because I thought of a body that would be in a cold environment for a long time', 'because the cadaver is treated carelessly', 'feeling helpless in the face of death', 'I don't have the courage to donate the body, and I think I can donate organs', and so on. The reasons for the change more positively than before were described as 'I have courage to see a cadaver that sacrifices himself or herself to help others.', 'realizing the sublime of the donors and becoming respectful', 'if I didn't have this chance, I would not think about donation', 'because I wanted to know more specific information about cadaver donation', and so on [Table 6].

**Table 6: Reasons for changes of cadaver donation intention after attending cadaver anatomy programs(N=24)**

Direction of change	Reason
negatively than the original intention( n=9)	-I felt sorry and uncomfortable for the damage to the body. -I thought of a body that would be in a cold environment for a long time. -I saw the cadaver treated carelessly. -I felt helpless before death. -I don't have the courage to donate the body, and I think I can do organs.
positively than the original intention( n=15)	-I have courage to see a cadaver that sacrifices himself or herself to help others. -I realized the sublime of the donors and became respectful. -If I didn't have this chance, I would not think about donation. -I wanted to know more specific information about cadaver donation.

## 4. Discussion

This study attempted to provide basic data for spreading a sound culture of cadaver donation. According to the general

characteristics, in the attitude toward cadaver donation, the score of religious students was higher than that of non-religious students ( $p < .001$ ). There was a difference between this and the results of a study on college students [17] and a study on paramedical students [15] in South Korea, in which there was no significant difference in attitude according to religion. On the other hand, in the study on Italian medical students [18], the probability for non-religious students to agree on cadaver donation was approximately 6 times higher than Catholic students, and in the Australian chiropractic students' study [19] and in the study on the anatomists [20] of 29 countries, it was shown that the intention toward cadaver donation was more positive in the case of no religion than the case of having religion. A study on medical students and surgical residents [21] in Kenya and a study conducted in India [22] also showed that they were opposed to cadaver donation due to cultural and religious reasons, and in a study on Chinese people, it was found that non-religious people were willing to donate 9.8 times more than those who have Confucian funeral beliefs [8]. Even though in the world most religions generally encourage and support cadaver donation, the final decision will depend on the individual's conscience and belief. Therefore, appropriate counseling and guidance are very needed to convert potential donors into actual donors.

In this study, the overall average score of attitudes toward cadaver donation was 3.33 points. This was higher than the college students' [15] organ donation attitude (2.97 points) [17] score, and slightly lower than the paramedical students' organ donation attitude (3.45), and the Korean nursing students' attitude score (3.49 points) [14] toward organ donation and transplantation who participated in the anatomy camp. The question that had the highest score was the cadaver donation is helpful to others (4.41 points), which was identical with the result (4.03 points) of the previous study [15]. As the content of the receptive attitude toward organ donation in a research study on organ donation intention of Korean high school students, and the content such as 'doing good to others', 'an important good act to help patients', 'a valuable thing', this is similar to having a positive meaning for donation [11]. The question that had the lowest score (2.36 points) was 'cadaver donation is a good and positive option for a family who has lost a loved family member even if the deceased has not expressed an opinion about body donation during his or her lifetime', which is in line with the responses of 'unpleasant thing', 'family will be sad', and 'it would be sad if the family was requested for organ donation' as the content of the exclusive attitude of organ donation in the previous study [11]. In general, brain death or post-mortem organ donation that occurred in the family is positively accepted by the public in that it extends the life of the family in the body of others [23], although it is part of the body, however, this is interpreted that there is an underlying perception that cadaver donation is only damaged.

12.5% of the respondents were positive about cadaver donation before participating in the practice using cadaver, and this figure was lower than the result (46.5%) of the previous study [15]. 54.7% of college students showed a willingness to practice donating organs when brain death [12] and 69.9% of high school students showed organ donation intention [11]. In the study on Italian medical students [18], 93% showed cadaver donation intention, and in the study [22] on Indian people, 82% showed a positive attitude toward cadaver donation including post-mortem organ transplantation, but cadaver donations for anatomical purposes were negligible at 5.66%. 32% out of Kenya medical students had cadaver donation intention, but, surprisingly 68% out of people who replied they did not have cadaver donation intention answered that they recommended others donate the cadaver for anatomy education, although they didn't have a willingness to donate [21]. In China, adults 27.5% showed cadaver donation intention [8]. In the previous study on Indian doctors, only 22% of the doctors who attended the survey answered, for medical education, they had a willingness to donate their cadavers, but 68% anticipated the public to donate the same [24]. 82.2% of Chinese adults supported organ donation, but only 53.3% agreed on post-mortem organ donation [23]. Similarly to this, in Nigeria, 60.9% of anatomists considered organ donation, but the rate of response to cadaver donation was only 23.9% [25]. In the previous study [20], 75% agreed on cadaver donation, of which the case of wanting only organ donation was 41%, the whole-body donation was 9%, and the case that both forms were good was 25%. In sum, the previous studies showed that respondents prefer organ donation a little to cadaver donation.

After participating in the cadaver anatomy practice, 30% of the respondents showed a change in their willingness to donate their cadaver, of which the case that changed from positive to negative was 62.5% was more than the case that changed from negative to positive (37.51%). In the previous study, after attending the cadaver anatomy practice, 29.5% of the respondents changed their intention for cadaver donation, of which the case that changed from positive to negative was 56.3%, and the case that changed from negative to positive was 42.1% [15]. The reasons why the intention toward cadaver donation had been changed from positive to negative were 'because I felt sorry and uncomfortable for the damage to the body', 'because the cadaver is treated carelessly', 'I don't have the courage to donate the cadaver, and I think I can donate organs', etc, and the reasons for the change more positively than before were 'I have courage to see a cadaver that sacrifices himself or herself to help others.', 'realizing the sublime of the donors and becoming respectful', etc. In the previous study, there were different opinions which were 'because it was very helpful in education while participating in the practice', 'because I learned the value and importance of the cadaver donation' [15]. A study on medical students in Mexico, that showed the anatomy practice experience helped the cadaver donation, supports this opinion. According to a study on paramedical students, the cadaver donation intention after the anatomy practice was 2.72 points out of 5, which was lower than the normal level, and overall responses negatively to donate the cadaver [1]. The other studies related to this showed people who thought it was important not to damage the cadaver after death were 37.7% of the total respondents [6]. Also, as a result of analyzing the overall importance and overall priority for the factors affecting the invigoration of cadaver donation, the first priority was 'improving the culture of reluctance to damage the cadaver', followed by 'age', 'invigorating the promotion of cadaver donation', 'expanding respect for donors', and so on [9]. In this study, these negative changes may be because the participants attended the anatomy practice without sufficient education where they can increase their understanding and knowledge about cadaver donation before the practice, and because it was judged based on the imprinted phenomenon of seeing the cadaver that was clearly dissected at the site of an unfamiliar anatomy laboratory that smelled of formalin [19,21]. Therefore, clear treatment instructions for handling dissected cadaver should be prepared. The cadaver should be approached with esteem and respect during

the anatomy period [2]. Estimable expressions like referring to the cadaver as a 'silent mentor, teacher' [10, 27-28], not just an anatomical specimen, were shown to affect positively the attitude of medical students toward the cadaver. The 'silent mentor' initiation ceremony has been found to help develop a more positive attitude toward death, reduce negative feelings toward the cadaver, and improve learning efficiency [10, 28]. Therefore, the spread of this awareness to the local community will improve awareness and acceptance of cadaver donation, and it is emphasized that it is very important to cultivate not only knowledgeable and skilled medical personnel, but also medical personnel who have benevolence and empathy for patients and society as a whole [28].

With regard to the importance of prior knowledge, in case college students have high knowledge of organ donation and they wish to donate organs, their willingness to practice was high [12]. Also, it was pointed out that the public's knowledge and attitude about post-mortem organ donation had a positive correlation, and that the public was biased because their knowledge on post-mortem organ donation was insufficient [23]. Absence of knowledge about the cadaver donation program is a barrier to become active donors for medical professionals and the public. Therefore, it will be necessary to regularly promote it in the voluntary organizations, media or in medical education camps and more health, schools, universities, and public places [2, 22-23]. Media and other social organizations could play a significant role as mediators that can reduce people's hesitation about donating the cadavers. The public must be aware that cadaver donations are necessary for organ donation or medical education research. Cadaver donation is an altruistic act for donating for medical education and research [24]. It is also socially unfortunate to be consistent with the exclusive attitude that it is simply unpleasant and fearful for the cadaver to be damaged.

Therefore, it is necessary to contribute to invigorating cadaver donation by operating an educational program that can enhance understanding and knowledge of cadaver donation based on the dignity of the donor before nursing students participate in the cadaver anatomy practice. The restricted point of this study is that as it was investigated on nursing students attending a single university, care should be taken when generalizing and expanding the results of the study.

## 5. Conclusion

Cadaver donation still plays a role very significantly in the development of anatomy practice and medicine despite the development of modern medical education media. This study attempted to present basic data to spread a healthy culture about cadaver donation for anatomy practice by identifying the attitude of nursing students toward cadaver donation. As a result of the study, attitude toward cadaver donation had a significant difference according to religion ( $<.001$ ). The average score of attitudes toward cadaver donation was 3.33 points. It was shown that in the cadaver donation intention 12.5% was positive before participating in the anatomy practice using cadaver. After participating in the anatomy practice using cadaver, 30% of the respondents showed a change in the cadaver donation intention, 62.5% were changed more negatively than before, and 37.5% were changed positively. In conclusion, nursing students had more than average positive attitudes toward cadaver donation, but after participating in the anatomy practice using cadaver, there were more negative changes in cadaver donation. Therefore, it is needed to endeavor to spread positive awareness through educational programs to increase their correct understanding and knowledge about cadaver donation before participating in the anatomy practice using cadaver. Based on the results of this study, I would like to make the following suggestions for invigorating cadaver donation for medical development. First, it is needful to identify and utilize various variables that influence the willingness to practice cadaver donation. Second, it is needed to research and develop educational programs that can enhance the correct understanding and practice willingness about cadaver donation. Various approaches which include the need, procedures and bioethics for cadaver donation are necessary in order to relieve psychological anxiety about cadaver donation and to have positive thinking. Third, a variety of studies on the ways how the willingness to practice cadaver donation can be sustained are necessary.

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